

LAB 6 :

Visualization and analysis of functional gene networks using Cytoscape



Data used in the network

1. Network : HumanNet v.1

a probabilistic functional gene network of 18,714 validated encoding genes of *Homo sapiens*. (Insuk *et al*, 2011)

We used subset of the network: 'breast cancer related genes'

2. Expression data: RNA-seq data

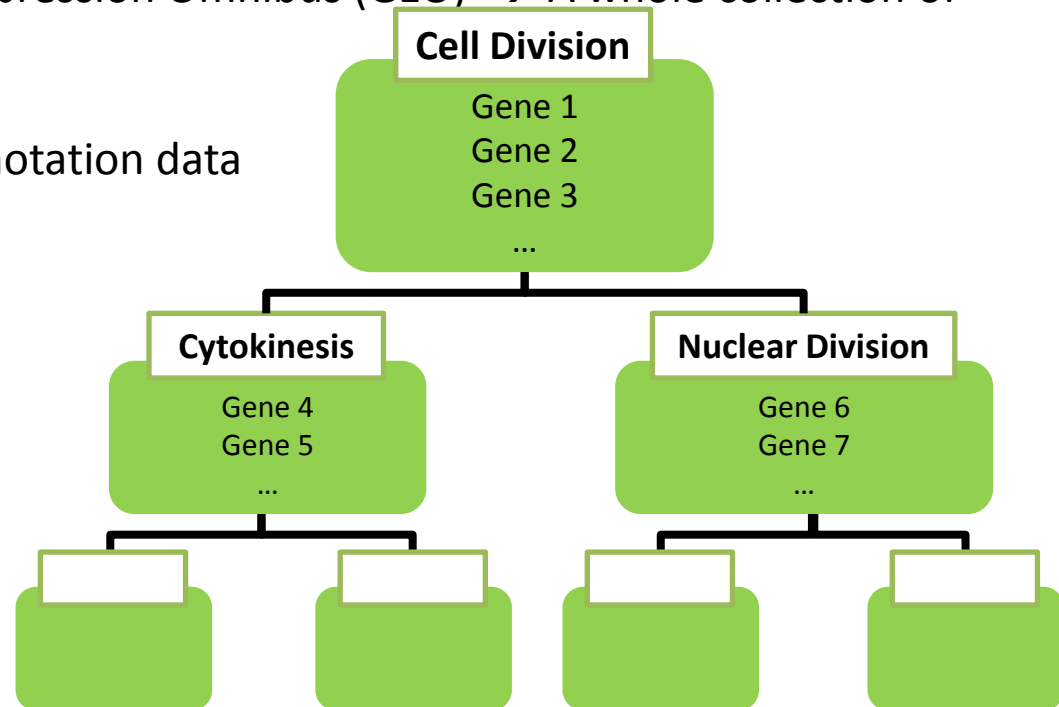
Samples are from 3 Breast cancer patients and 3 normal .

Breast cancer patients have specific type of cancer : Triple Negative Breast Cancer
Data downloaded from : Gene Expression Omnibus (GEO) → A whole collection of various expression data

3. Gene Ontology : Gene-Function annotation data

Described in 3 domains

- Molecular Function
- Cellular Component
- **Biological Process**



Report

Assignment : Draw given Network with Cytoscape on your own.

Things to include

1. Date of the experiment and the day (Tue, Wed, Thur, Fri)
2. Results with “figures of your own” (**1 network file with gradient color, 1 with BINGO output**)
3. Discussion
4. References

Discussion should include :

- What the network visualization tells you.
(What information does the network give you? What can you tell from the expression data and function enrichment analysis using Bingo? → No correct answer for this. Just write what you think)
- Other type of visualization may give you additional points. If you have made modifications, describe what you have done in the report

Data to draw the network can be found in : www.netbiolab.org → teaching

Find Cytoscape at : www.cytoscape.org

Lab Address: Science Research Center (과학원) S323 Questions:

Email to vxterran@gmail.com

Due date : Experiment date -> Due date

3/30 -> 4/13

4/3 -> 4/17

3/31 -> 4/14

4/4 -> 4/18

1. www.cytoscape.org



Cytoscape

Network Data Integration, Analysis, and Visualization in a Box

Introduction

Download 3.5.0



2. Click orange button to download cytoscape.
3. Click [Java 8](#) to download Java 8.

Download Cytoscape 3.5.0



for Windows (64 bit)

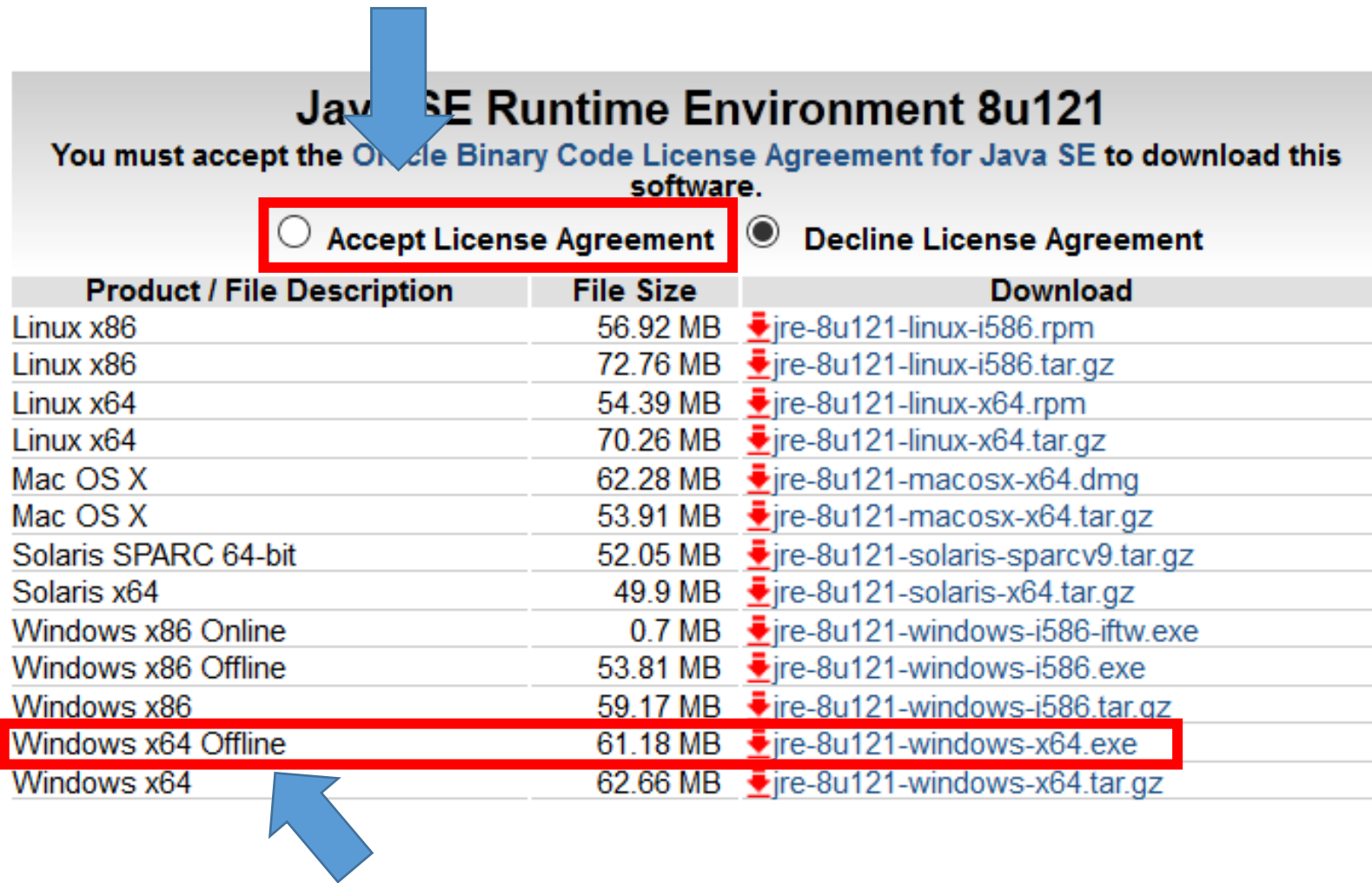
Please install [Java 8](#) first to use Cytoscape.

Java 6 & 7 are no longer supported

Problems? [Read the page first](#)

[Release Notes](#)

4. Download Java 8 that suits your OS.



Java SE Runtime Environment 8u121

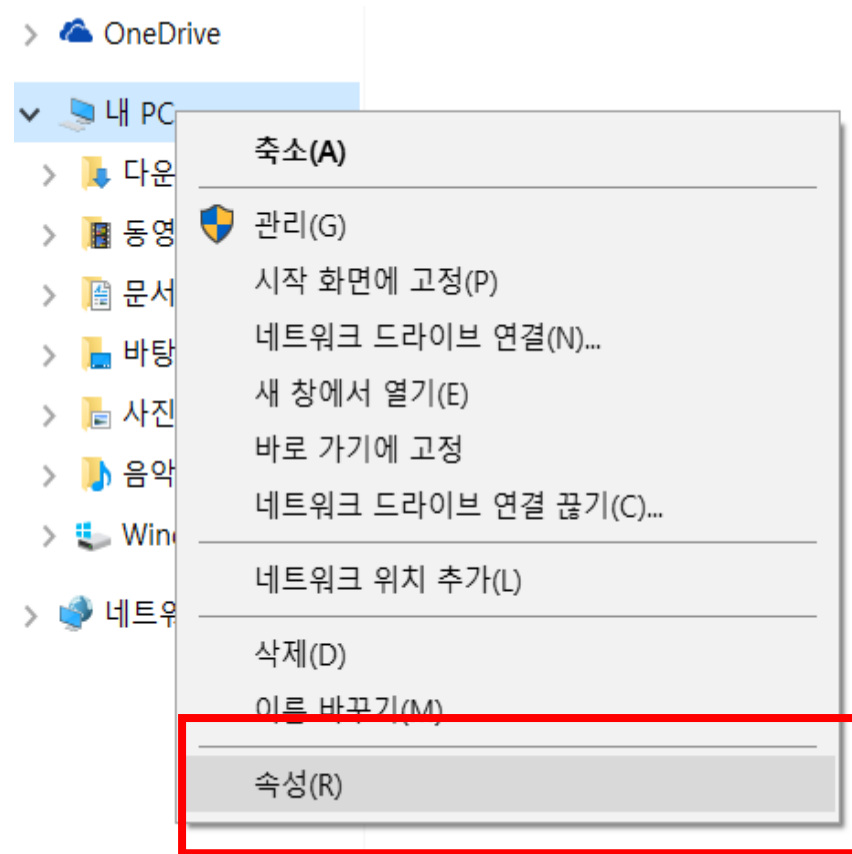
You must accept the [Oracle Binary Code License Agreement for Java SE](#) to download this software.

☐ **Accept License Agreement** ☒ **Decline License Agreement**

Product / File Description	File Size	Download
Linux x86	56.92 MB	jre-8u121-linux-i586.rpm
Linux x86	72.76 MB	jre-8u121-linux-i586.tar.gz
Linux x64	54.39 MB	jre-8u121-linux-x64.rpm
Linux x64	70.26 MB	jre-8u121-linux-x64.tar.gz
Mac OS X	62.28 MB	jre-8u121-macosx-x64.dmg
Mac OS X	53.91 MB	jre-8u121-macosx-x64.tar.gz
Solaris SPARC 64-bit	52.05 MB	jre-8u121-solaris-sparcv9.tar.gz
Solaris x64	49.9 MB	jre-8u121-solaris-x64.tar.gz
Windows x86 Online	0.7 MB	jre-8u121-windows-i586-iftw.exe
Windows x86 Offline	53.81 MB	jre-8u121-windows-i586.exe
Windows x86	59.17 MB	jre-8u121-windows-i586.tar.gz
Windows x64 Offline	61.18 MB	jre-8u121-windows-x64.exe
Windows x64	62.66 MB	jre-8u121-windows-x64.tar.gz

5. Install Java and Cytoscape by default setting.

How to check your computer's OS version. (windows case)



컴퓨터에 대한 기본 정보 보기

Windows 버전

Windows 10 Home

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시스템

프로세서: Intel(R) Pentium(R) CPU N3540 @ 2.16GHz 2.16 GHz

설치된 메모리(RAM): 4.00GB(3.88GB 사용 가능)

시스템 종류: 64비트 운영 체제, x64 기반 프로세서

펜 및 터치: 이 디스플레이에 사용할 수 있는 펜 또는 터치식 입력이 없습니다.

컴퓨터 이름, 도메인 및 작업 그룹 설정

컴퓨터 이름: 200laptop

전체 컴퓨터 이름: 200laptop

컴퓨터 설명:

작업 그룹: WORKGROUP

Windows 정품 인증

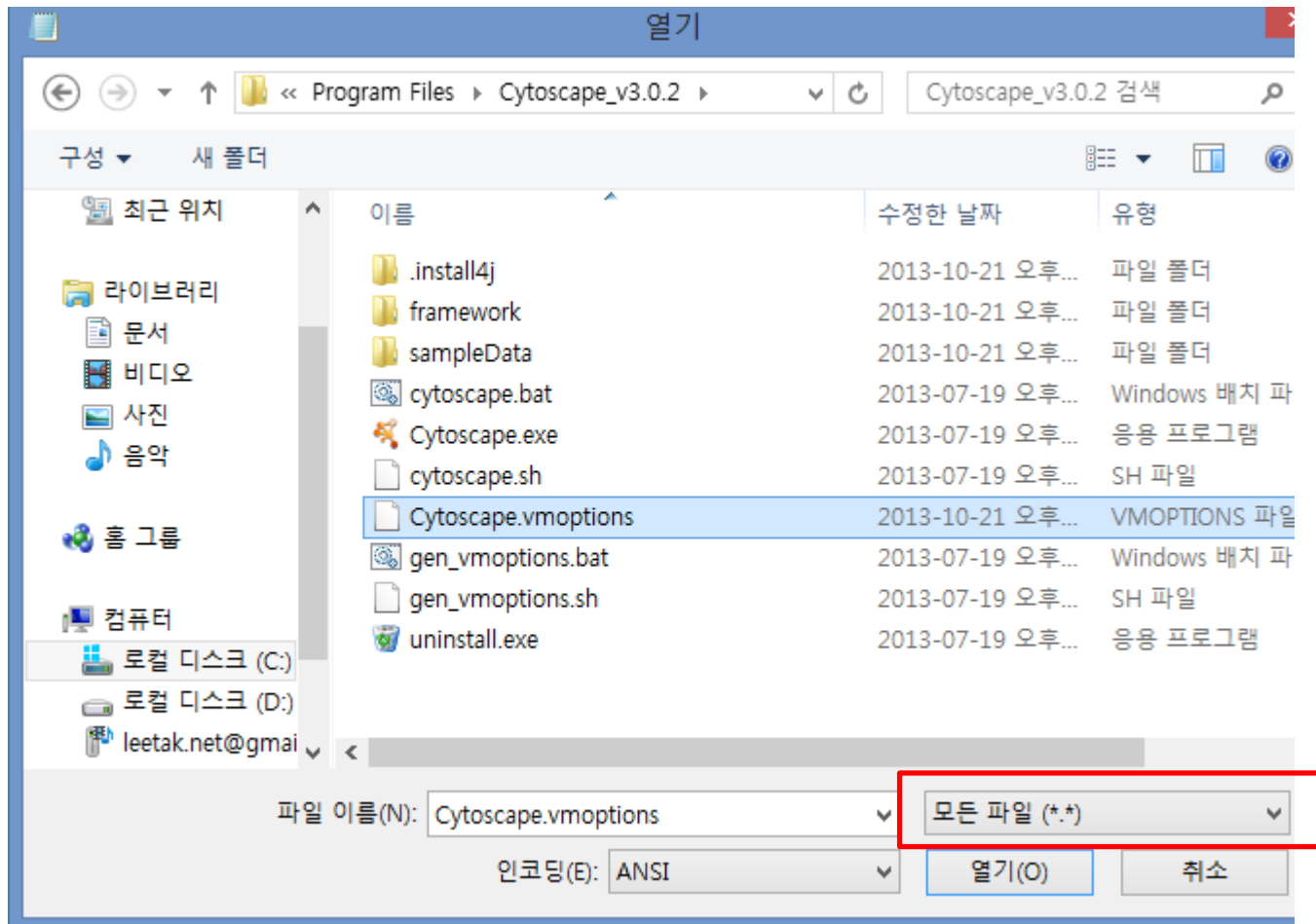
Windows 정품 인증을 받았습니다. [Microsoft 소프트웨어 사용 조건 읽기](#)

제품 ID: 00326-10000-00000-AA758

자바 충돌 문제 해결

메모장을 “관리자 권한”으로 실행

파일 → 열기 → cytoscape 파일 → Cytoscape_vmoptions 파일을 열기



모든 파일 선택

자바 충돌 문제 해결

메모장을 “관리자 권한”으로 실행

파일 → 열기 → cytoscape 파일 → Cytoscape_vmoptions 파일을 열기

-Xmx1250m 을 -Xmx512m으로 수정하여 저장

내용 보강

Usage for BiNGO application

Using the file to install BINGO and running it.

1. Apps → App manager → install from file (lower left) → Select “BiNGO jar”

2. Running BiNGO

1) Select all genes in the network (Ctrl + A)

2) Apps → BiNGO

3) BiNGO settings

Type cluster name : any names

Select ontology file : → custom : “ file gene_ontology_ext.obo”

Select namespace → ---

Select organism/annotation → custom “ file : GOBP.BiNGO.txt”

3. start BiNGO. It will take some time.